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ACACIA MEDIA TECHNOLOGIES CORPORATION

UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

In re ACACIA MEDIA TECHNOLOGIES CORPORATION	Case No. 05 CV 01114 JW **DECLARATION OF S. MERRILL WEISS IN SUPPORT OF PLAINTIFF ACACIA MEDIA TECHNOLOGIES CORPORATION'S MOTION FOR RECONSIDERATION OF CERTAIN CLAIM CONSTRUCTION TERMS CONSTRUED BY THE COURT IN ITS THIRD CLAIM CONSTRUCTION ORDER AND ITS FOURTH CLAIM CONSTRUCTION ORDER** DATE: August 17, 2007 TIME: 9:00 a.m. CTRM: Hon. James Ware

I, S. Merrill Weiss, hereby declare as follows:

I. Introduction

1. I, S. Merrill Weiss, am a citizen of the United States and reside in Edison, New Jersey. I have personal knowledge of the facts stated herein and, if called as a witness, I could and would testify competently thereto.

2. I have been retained by counsel for plaintiffs, Acacia Media Technologies Corporation, as a testifying expert to study and provide consultation, testimony, and opinions regarding the patent infringement litigation with respect to U.S. Patent Numbers 5,132,992, 5,253,275, 5,550,863, 6,002,720, and 6,144,702 (respectively, the '992, '275, '863, '720, and '702 patents), all titled "Audio and Video Transmission and Receiving System," as described in this declaration.

3. I have been asked to comment, in this Declaration, on the term "Transmission System," on the term "Receiving System," on the word "Storing," on the use of Multiple Files in the system described in the patents, and on the Order of Steps and a potential error with respect to the portion of the specification of the '992 patent at column 17, lines 44-53.

II. Credentials

4. I am a consultant in electronic media technology, technology management, and management, serving clients in the United States, Canada, Central and South America, Japan, Europe, and the Middle East. These clients have included broadcast television networks, broadcast television stations, cable and satellite programming networks, cable, wireless cable, and satellite television system operators, major research laboratories, Hollywood studios, broadcast and television equipment manufacturing companies, common carriers of television and other broadcast signals, investment bankers, as well as industry associations representing these various entities. During the course of my consulting work, I am in routine contact with employees of the entities discussed above, including those employees having programming and engineering responsibilities.

5. My complete credentials were supplied in the current case in my Declaration dated October 20, 2004 (¶¶3-12), and therefore will not be repeated fully herein. They have not changed in the time since that earlier Declaration, with the following exceptions: I now have over forty years experience in broadcasting and related fields, with over thirty years in management and consulting. My experience now includes over thirty-nine years designing, building, and managing new technical facilities for various electronic media employers and clients. It now has been over thirty years that I have been working on the development of new television technologies and the writing of standards for them, including analog video, digital video, component video, digital control, digital video compression, and all the associated data and metadata functionality. I remain involved in the development of enhanced and interactive television and other technologies that depend upon the convergence of television, computing, and data communications.

6. My continuous service as chairman of one or another of the technology committees of the Society of Motion Picture and Television Engineers (SMPTE) now extends over twenty-five years. In November, 2005, I was the recipient of the SMPTE Progress Medal "honoring the individual by recognizing outstanding technical contributions to the progress of engineering phases of the motion picture and/or television industries, … awarded for an invention or for research or development that … has resulted in a significant advance in the development of motion picture or television technology. …[C]ontinued technical contributions over a period of years … weighed as an important factor."

7. In April, 2006, the National Association of Broadcasters recognized me with its Television Engineering Achievement Award "for pioneering work in the development of advanced television technologies and applications … for outstanding leadership in setting international standards for digital television production and transmission … and for nearly 40 years of commitment to the highest standards of excellence in design, implementation, and management of television engineering."

8. Also in 2006, I was awarded my second U.S. Patent, No. 7,110,048, "Digital Signal Transmitter Synchronization System." It describes a method for synchronizing digital transmitters to form a Single-Frequency Network (SFN). The technology described was adopted by the Advanced Television Systems Committee (ATSC) and provides the foundation for the ATSC Synchronization Standard for Distributed Transmission (A/110). (The patent was issued September 19, 2006.) In the time since the last Declaration, I have presented or published thirteen additional technical papers or documents on diverse television and related technologies.

9. An updated copy of my *curriculum vitae*, which summarizes my qualifications and professional experience, is attached as Exhibit A hereto. My *curriculum vitae* include a complete list of my publications.

III. Compensation

10. I continue to be compensated for my work in this case at my customary rate of $350 per hour, plus expenses. In the event that I am called to testify, my compensation rate is $400 per hour. My compensation is not based on the outcome of the litigation.

IV. Prior Testimony

11. Within the last four (4) years, I have not testified as an expert witness at trial. I testified during a hearing on claim construction in the current case in September, 2005. I have testified by deposition in the case of Superguide Corporation vs. DirecTV Enterprises vs. Gemstar Development Corporation, Civil Action No. 1:00 CV 144-T, United States District Court for the Western District of North Carolina, Asheville Division; in the case of Parental Guide of Texas, Inc. vs. Funai Corporation, Inc., et al, Civil Action No.: 2:00 CV 262, United States District Court for the Eastern District of Texas, Marshall Division; and in the case of Zenith Electronics Corporation v. WH-TV Broadcasting Corporation and WH-TV Broadcasting Corporation v. Zenith Electronics Corporation, Motorola, Inc. and General Instrument Corporation, Civil Action No. 01C 4366, United States District Court for the Northern District of Illinois, Eastern Division.

V. Transmission System

12. In its Third Claim Construction Order, dated December 14, 2006, the Court reconsidered its earlier construction of the phrases and declared that, "The phrases 'transmission system' and 'reception system' are coined terms." I have been asked whether the phrases "transmission system" and "receiving system" would have had customary meanings to one of ordinary skill in the field relevant to the patent family in 1991.

13. The term "transmission system" was well known and often used by 1991. Its definition was included in the IEEE Standard Dictionary of Electrical and Electronics Terms, of which the 6th edition, IEEE Std 100-1996, published in 1996, (hereinafter, the "IEEE Dictionary") is the most contemporaneous version readily available to this writer: "[i]n communication practice, an assembly of elements capable of functioning together to transmit signal waves." In the IEEE Dictionary, the phrase "transmission system" is used 373 times in the contexts of a variety of system types; it is defined directly with respect to the contexts of power transmission and data transmission.

14. The term "transmission system" was used many times in patents prior to 1991. A search of the US Patent and Trademark Office database indicates that there were 1,177 patents issued in the 15 years prior to 1991 (i.e, from January 1, 1976 through December 31, 1990) that contained the term "transmission system" in their titles. During the same period, there were 9,091 patents issued that contained the phrase in their specifications. Not all of the patents containing the words "transmission system" in their titles or specifications relate to a video and audio transmission system, but a search of patents issued during the period that contained the phrase "transmission system" plus the words "video," "audio," or "television" in their specifications located 1,958 such patents.

VI. Receiving System

15. The term "receiving system" was well known and often used by 1991. Although its definition was not included in the IEEE Dictionary, the phrase "receiving system" is used 55 times

in the contexts of a variety of system types. As evidenced by the repeated use of the term "receiving system" in the prior art (as described in the paragraph below), a person of ordinary skill in the art in 1991 would have understood that the term "receiving system" was the inverse of the term "transmission system" and that it would have meant "an assembly of elements capable of functioning together to receive transmitted signal waves."

16. The term "receiving system" was used many times in patents prior to 1991. A search of the US Patent and Trademark Office database indicates that there were 78 patents issued in the 15 years prior to 1991 (i.e, from January 1, 1976 through December 31, 1990) that contained the term "receiving system" in their titles. During the same period, there were 1,707 patents issued that contained the phrase in their specifications. Not all of the patents containing the words "receiving system" in their titles or specifications relate to a video and audio receiving system, but a search of patents issued during the period that contained the phrase "receiving system" plus the words "video," "audio," or "television" in their specifications located 638 such patents.

VII. Storing

17. I have been asked what the word "storing" would have meant to one of ordinary skill in the field relevant to the patent family in 1991. The concept of storing has two aspects. One is the aspect of placing or putting objects or information into a storage container. The other aspect is the act of retaining, holding, or maintaining objects or information that already exist in a storage container.

18. There are many ways in which objects or information can be put into a storage container. In the context of the patents at issue, the storage ultimately will be in digital data form, with provisions made in certain parts of the system for storing a variety of materials in other forms. The requirements for placing any specific contents into storage will depend upon the types of content items and the configuration of the storage system for accommodating that particular type of content. For example, the content of a motion picture could be stored in silver halide of varying

density on a celluloid strip on a film reel, in an analog or digital tape recording of an electronic representation of the image and sound that constitute the motion picture content, or as a digital data file containing another type of electronic representation of the image and sound that constitute the content of the motion picture. The data file, in turn, could be contained in anything from volatile random access memory (RAM) to rotating magnetic storage devices (e.g., hard drives) to rotating optical media (e.g., compact disks – CDs). Once stored, the content could be relatively easily moved from one form of representation to another in order best to meet the needs for preservation and utilization of the content. When in digital form, the content also may be stored in a compressed or an uncompressed manner.

19. Once content is entered into a storage system, the other aspect of "storing" comes into play: The content must be retained and maintained so that it will be available for use when needed. It is well known (and was in 1991) that keeping content in storage requires active maintenance in order to avoid deterioration of the material. For film and tape, such maintenance often includes retaining the media in an environment having controlled temperature and humidity – sometimes with robotic machinery to load and unload the media for reading when necessary and sometimes involving human loading and unloading of the media to and from appropriate transport devices when needed. When the content is stored in volatile memory, the storage maintenance process may involve keeping power on the memory devices and continually refreshing them through a combination of pulses applied to them. When the content is stored on rotating media of all sorts, the maintenance process likely will involve the periodic movement of copies of the content from one medium to another as the medium on which the content is stored reaches end-of-life as an individual unit or when the particular type of medium is no longer supported as a product and is superseded by more modern technology.

VIII. Multiple Files

20. I have been asked to comment on whether the use of multiple files for storage of data is described in the '992 patent. One of ordinary skill in the art in 1991, when reading the specification of the '992 patent, would have understood that the '992 patent describes three structures in the transmission system in which multiple files may be stored: (1) the compressed data library 118 (at column 10, lines 31-45); (2) the short term storage section 117' of the compressed data storing means 117 (at column 7, lines 44-58), and the storage element 203 in the reception system 200..

21. The '992 patent describes the compressed data library 118 as the storage device or network of storage devices that store the files containing the compressed audio and video data before the files or the portions of the files are transmitted. To ensure that each of the files is distinguished from the other files stored in the compressed data library, each item having information was assigned a unique address code, which has a one-for-one correspondence with the file that contains the information for that item, as described in the specification at 10:17-30. The unique address code can be used to locate any file stored in the compressed data library and for addressability of items, as described in the specification at 10:46-65.

22. The '992 patent describes receiving pre-compressed materials, such as inter-library transfers, that are passed directly from identification encoder 112 to the compressed data formatter 117 without requiring pre-compression or compression processing, as described at 7:44-57. Within the compressed data formatting section 117 exists a short-term storage function 117' to which the pre-compressed materials are input. Since items are stored in the compressed data library 118 in files, materials transferred into the short-term storage 117' must also be in the form of files by the time they have been reformatted to be compatible with the material stored in the compressed data library. Given that they already have been passed through the identification encoder 112 for assignment of their unique address codes, there must be a one-for-one correspondence between the

files and the address codes. Hence, different files will exist in the short-term storage element 117' at least at different times and potentially at the same time, depending upon the capacity of the compressed data formatting section 117.

23. The reception system 200 includes a storage element 203, as described at 18:17-21. The storage element 203 is shown in Figure 6 using the conventional symbol for a hard drive or similar storage hardware. A person of ordinary skill in the art in 1991 would have recognized that such a storage capability, given sufficient capacity, could hold more than one file, thereby permitting downloading of the information for two or more items for viewing at separate times.

IX. Order of Steps in Claim 46

24. I have been asked to comment on the order of the steps of claim 46 of the '992 patent. Claim 46 depends from claim 45, and claim 45 depends from claim 41. Claim 46 adds to claim 45 the additional steps of:

- generating a listing of available items;
- receiving transmission requests to transmit available items; and
- retrieving stored formatted data blocks corresponding to requests from users.

25. A person of ordinary skill in the art in 1991 would have understood that there is nothing in claim 46 itself that states that any of these steps is performed in any particular order with respect to any other steps of claim 45 or claim 41. The preamble of claim 46 states only that claim 46 is for "a transmission method as recited in claim 45, further comprising the steps, performed by the transmission system," and it does not state where, among the steps of claim 45 or claim 41, the steps of claim 46 would occur.

26. A person of ordinary skill in the art in 1991 also would have understood that the steps of claim 46 itself would be performed in the order in which they are recited. This is apparent from the fact that a list of the available items likely would have to be generated before a transmission request to transmit an available item could be received and from the fact that the request for

transmission would have to be received before the data blocks corresponding to that request could be retrieved.

27. A person of ordinary skill in the art further would have understood that the step of generating the listing of available items normally would occur after there existed available items that could be requested. According to the specification, user requests are made either for items stored in the source material library (as discussed at column 18, line 53 – column 19, line 10) or for items stored in the compressed data library (as discussed at column 13, lines 29-47). Thus, the person of ordinary skill in the art in 1991 would have understood that the step of "generating a listing of available items" normally would occur after the items having information are stored in the source material library or after the files containing the compressed video and audio information are stored in the compressed data library.

28. A person of ordinary skill in the art in 1991 also would have understood, however, that, at least in some cases, it would be known in advance of its storage in the source material library that certain items of information would become available in the future, for example, a film that was to be released on a future date that would then be made available through the system or content that had been received but just not yet processed. In such cases, it would be possible to include in the listing of available items content that was not yet stored in the source material library. Any requests for such items then might result in those items being moved up in priority for processing into the system, or they might be scheduled for future delivery once they became available on the system. The result would be that the generation of the list of available items and the receiving of requests to transmit items might occur prior to the actual availability of certain listed and requested items on the system.

X. Potential Error in the Specification at Column 17, lines 44-53

29. I have been asked to comment on a potential error in the specification of the '992 patent, at Column 17, lines 44-53, with respect to whether the reference to "[t]he library access

interface 121 in the reception system 200 preferably includes a title window where a list of available titles are alphabetically listed" should refer instead to the transmission system in Figure 2b rather than to the reception system 200.

30. A person of ordinary skill in the art in 1991 would have understood the paragraph at column 17, lines 44-53, to be describing features of the reception system 200. This paragraph immediately follows four paragraphs that describe the reception system. At the same time, column 14, line 64, through column 15, line 1, describes "access from various terminals including personal computers, and specialized interfaces built into the reception system 200 for the user. Such access allows a user to do a search of available programs from a computer screen." Thus, access to the library must be provided to users on computer screens both on independent terminals (e.g., PCs) and on reception systems.

31. The listing of content available on the system is made available to users through control computer 1123, whether that information resides on the control computer or on the remote order processing and item database 300, as described at 11:66 – 12:7 and 17:51-53. The information from control computer 1123 is distributed to users through library access interface 121 in the transmission system 100. One of the places where the information from the transmission system can be presented to the user is through one of the specialized interfaces built into the reception system 200. Given all this, persons of ordinary skill in the art would have understood the paragraph in question in column 17 as though its first sentence had been written as follows: "The information distributed by the library access interface 121, when presented by the reception system 200, preferably includes a title window where available titles are alphabetically listed." It would be expected that the presentation of the same information on other displays, such as those connected to personal computers, would be formatted in about the same way.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge and belief.

Executed this 18th day of May, 2007, at Metuchen, New Jersey.

S. Merrill Weiss

Exhibit A

227 Central Avenue
Metuchen, NJ 08840-1242
(732) 494-6400 Phone
(732) 494-6401 Fax

Merrill Weiss Group LLC

Consultants in Electronic Media Technology/Management

Resume of S. Merrill Weiss

SUMMARY:

- Over forty years experience in broadcasting and related fields with over thirty-one years in management and consulting.
- Executive management as president of a start-up electronics company.
- Management of a large, in-house technical design and construction operation with significant staff and budget responsibilities.
- Project management from concept and definition, through planning and budgeting, systems and technical design, to supervision of installation and operation.
- All aspects and levels of broadcast station technical operation and management.
- Extensive participation in FCC Advisory Committee on Advanced Television Service process for selection of the next generation of television for the United States.
- Designed systems and techniques that have become industry standards, both documented and de facto. Responsible for technical support of several significant changes to FCC Rules.
- Presented or published over one hundred papers or articles on various aspects of video, digital video compression, High Definition Television, broadcasting, and wireless cable. Author of two books on ATV/DTV/HDTV.
- Member or chairman of numerous industry technical standards committees and producer of several tests and demonstrations leading to important international standards. Co-chairman of EBU/SMPTE Task Force on Harmonized Standards for Exchange of Program Material as Bit Streams. Founder and facilitator of the Video Services Forum.
- Fellow of Society of Motion Picture and Television Engineers (SMPTE) and highest level of Certification (Professional Broadcast Engineer) by Society of Broadcast Engineers. Recipient of David Sarnoff Gold Medal (1995), Progress Medal (2005) – both SMPTE. Recipient: NAB Television Engineering Achievement Award (2006). Nominated for Emmy Award (1993).

PROFESSIONAL EXPERIENCE: Detailed on the following pages.

AWARDS, PATENTS, EDUCATION, CERTIFICATION, LICENSES: Follows Professional Experience.

PROFESSIONAL ACTIVITIES: See Attachment A.

PAPERS AND PUBLICATIONS: See Attachment B.

PROFESSIONAL EXPERIENCE:

February, 1991 to Present
Consultant in Electronic Media
Technology / Management

Merrill Weiss Group LLC
227 Central Avenue
Metuchen, NJ 08840-1242

Providing consulting services in the general area of electronic media technology, technology management, and general management to a wide range of clients. Included among international clients have been investment bankers, research laboratories, industry organizations, intellectual property attorneys, manufacturing companies, television networks, television stations and group owners, wireless cable and wireless broadband access system operators, cable multiple system operators, the United States government, and major Hollywood studios. Assignments have included analysis of technology and management of a take-over target; development of digital image compression technology for use by an industry segment; development of technology strategies for several companies and industry segments; participation in government and industry standardization activities; serving as an expert witness; facilitation of an industry organization for technology and operations coordination among cooperating/competing companies; market research; request for proposal and proposal preparation for system and equipment purchases and sales, respectively; system analysis; propagation/interference analysis; FCC license application preparation; project management; studio, earth station, and transmitter plant system design and implementation; system automation; report writing and editing; among others.

October, 1985, to April, 1991
Managing Director,
Advanced Television Systems
Managing Director,
Systems Engineering

Operations and Technical
Services
National Broadcasting Co.
30 Rockefeller Plaza
New York, NY 10112

As Managing Director, Systems Engineering, held management responsibility for in-house technical design and construction activity for NBC facilities in New York and Burbank. Turned organization around to on-time and on-budget performance while increasing size of activity from $30 million to $50 million in annual project load. Responsible for projects that started the automation of NBC studio facilities and on-air delayed playback. Oversaw numerous other projects while supervising staff of 140+, including union and management, with 36 design engineers. Initiated conversion to Computer Aided Design (CAD) and computer supported project management using IBM mainframe, workstations, and networked PCs for fully integrated department management, project reporting and control.

As Managing Director, Advanced Television Systems, had responsibility for NBC's work in the development of Advanced Television systems. This included NBC participation in Advanced Compatible Television (ACTV), a single channel, compatible EDTV system, and in Advanced Television Research Consortium (ATRC) development of Advanced Digital HDTV (AD-HDTV), a simulcast HDTV system for terrestrial broadcast. Represented NBC in the FCC Advisory Committee on Advanced Television Service process, including numerous committee activities. Also had responsibility for NBC production in HDTV in support of research and demonstrations. Managed ATRC demonstration at 1990 National Association of Broadcasters (NAB) Convention.

February, 1984, thru October, 1985
President

Imagex Corporation
5500 Shellmound Street
Suite 200
Emeryville, CA 94608

Part of a group that put together a company to work in the image database and video editing fields. Included were systems integration and software development. A video editor was developed and sold to another company to continue its development and bring it to market. The software written to support the image database had wide applications in other fields and was sold for those purposes. The image database product was demonstrated to a number of potential customers with quite positive responses, but required venture funding to complete its development was not obtained. The company therefore ceased operation.

February, 1978, thru January, 1984
Engineering Manager
Assistant Engineering Manager

KPIX Television
Westinghouse Broadcasting Co.
855 Battery Street
San Francisco, CA 94111

As Assistant Engineering Manager, designed and supervised the construction of a new studio facility for this major, fifth market TV station within a two-year time frame. Included in the project was design of a microcomputerized machine control system upon which the SMPTE/EBU standard is partially based. Also designed a microcomputerized control system which interfaced videotape cartridge machines to both a master control automation system and the machine control system. Devised the first use of alphanumeric displays in production equipment, including video switchers, routing switchers, and audio consoles. Numerous design innovations made KPIX the model for new stations and major upgrades for nearly a decade. Also responsible for day-to-day operations of old and new facilities. Responsible for FCC rules compliance and for preparing comments for Group W (Westinghouse) to FCC rule-making proceedings. Upon completion of new facility, began five year program of further development contemplated in the initial design.

As Engineering Manager, managed an engineering department with a staff of 50+, operating budget of $2.5+ million, and capital outlays accumulating to $4+ million at any one time. Designed and managed construction of $1+ million earth station facility, including San Francisco's first broadcast uplink. Purchased and installed first Central Lending Library still store system and first U.S. installation of new, fully automated studio cameras. Designed and purchased telco bypass system using non-broadcast microwave frequencies to control costs by replacing leased lines. Completed five-year development program in four years.

April, 1976, to February, 1978
Engineering Supervisor

KYW Television
Westinghouse Broadcasting Co.
Independence Mall East
Philadelphia, PA 19106

Managed design and installation projects, day-to-day operations, remotes, and special program activities. Supervised crew producing nationally syndicated Mike Douglas Show. Supervised first complete conversion of a major market television station news operation to ENG. Produced first international satellite broadcast by a local television station, feeding a domestic one-time-only network.

March, 1972, to April, 1976
Engineering Technician

KYW Radio
Westinghouse Broadcasting Co.
Independence Mall East
Philadelphia, PA 19106

Participated in design and installed new studio facilities for this all-news radio station. Designed and built specialized equipment for news operations including one of the first high fidelity radio ENG operations; full duplex, special purpose radios, including portables, to extend the studio into the field; and a network alerting system for the Group W radio group.

April, 1968, to March, 1972
Engineering Technician

WHYY, Incorporated
WHYY-TV, WUHY-TV, WUHY-FM
Philadelphia, PA 19106

Designed and built new studio facilities for this public broadcaster's radio station. Helped construct Pennsylvania Public Television Network's initial Network Operations Center, located at WHYY. Involved in day-to-day operation of the stations and in maintenance.

February, 1967, to April, 1968
Engineering Technician

WIP Radio & WMMR-FM
Metromedia Broadcasting
Philadelphia, PA 19103

Involved in day-to-day operation of the stations and in maintenance.

AWARDS, PATENTS, EDUCATION, CERTIFICATION, LICENSES:

Elected Fellow by Society of Motion Picture and Television Engineers (SMPTE), 1987.

Emmy Award nomination by National Academy of Television Arts and Sciences (NATAS), 1993, for "development of the technology and the international consensus on standards for the Serial Digital Interface for interconnection of television equipment."

David Sarnoff Gold Medal Award recipient, SMPTE, 1995, "recognizing outstanding contributions in the development of new techniques or equipment that have contributed to the improvement of the engineering phases of television …"

Progress Medal Award recipient, SMPTE 2005, "honoring the individual by recognizing outstanding technical contributions to the progress of engineering phases of the motion picture and/or television industries, … awarded for an invention or for research or development that … has resulted in a significant advance in the development of motion picture or television technology. …[C]ontinued technical contributions over a period of years … weighed as an important factor."

Television Engineering Achievement Award, National Association of Broadcasters (NAB), 2006, "for pioneering work in the development of advanced television technologies and applications … for outstanding leadership in setting international standards for digital television production and transmission … and for nearly 40 years of commitment to the highest standards of excellence in design, implementation, and management of television engineering."

U.S. Patent No. 5,812,220, "Television Transmission System Having Signal and Antenna Element Redundancy." Describes a method for combining a multiplicity of high power digital television stations into a single antenna in a small aperture. (Issued September 22, 1998)

U.S. Patent No. 7,110,048, "Digital Signal Transmitter Synchronization System." Describes a method for synchronizing digital transmitters to form a Single-Frequency Network (SFN). The technology described was adopted by the Advanced Television Systems Committee (ATSC) and provides the foundation for the ATSC Synchronization Standard for Distributed Transmission (A/110). (Issued September 19, 2006)

B.B.A., 1976, Wharton School, University of Pennsylvania.
(Bachelor of Business Administration, Major in Management)

Certified Professional Broadcast Engineer, by Society of Broadcast Engineers (SBE), certified since 1980, endorsed for both AM/FM and Television (first person certified for both).

First Class FCC Radiotelephone license, since 1962.

Second Class FCC Radiotelegraph license, since 1962.

Amateur Extra Class FCC license, K2MW, since 1962 (first licensed 1959).

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE:

Systems Subcommittee:
Member, 1988 to 1995 (completion).

Systems Subcommittee Working Party 1 on Systems Analysis (SS/WP-1):
Member, 1988 to 1995 (completion);
SS/WP-1 Task Force on Systems Analysis: Member, 1990 to 1995 (completion).
SS/WP-1 COFDM Certification Expert Group: Member, 1995 (inception to completion)

Systems Subcommittee Working Party 3 on Economic Analysis (SS/WP-3):
Member, 1988 to 1995 (completion).

Implementation Subcommittee:
Member, 1988 to 1995 (completion).

Implementation Subcommittee Working Party 1 on Policy & Regulation:
Member, 1989 to 1995 (completion).

Implementation Subcommittee Working Party 2 on Transition Scenarios:
Vice Chairman, 1988 to 1995 (completion); Acting Chairman, 1989 to 1995.

Technical Sub-Group of the Special Panel, Expert Groups on Transport and Transmission
Member, 1993 to 1995 (completion).

SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS:

Society of Motion Picture and Television Engineers (SMPTE):
Member, 1978 to present;
Elected Fellow, 1987;
Engineering Director for Television, 1996 through 1999. Had broad responsibility for organization and management of television standards development on worldwide basis.

SMPTE Working Group on Digital Video Standards (WG-DVS):
Member, 1977 (inception) to 1985 (when superseded by WG-SVS);
Member, Drafting Committee for Composite Digital Interface Standard, Sept., 1978, to Feb., 1980;
Co-produced First Demonstrations of Component-Coded Digital Video, San Francisco, February, 1981, which were held at KPIX and which led to the first international agreement on digital sampling and coding, later embodied as standards in CCIR (now ITU-R) fRecommendation 601 and SMPTE 125M;
Member, Subcommittee on NTSC/Digital Interface, Apr. to Nov., 1981;
Member, Sub-Group on Digital Studio Implementation, June, 1981, to Nov., 1982.

SMPTE Working Group on Digital Control of Television Equipment:
Member, 1978 (inception) to 1984;
Conducted the tests, held at KPIX in October, 1980, that validated the standard interface then being adopted by the Working Group. KPIX had the only large system in existence that worked compatibly with the proposed standard and on which it could be tested. SMPTE standard was based on the KPIX microcomputer network design and interfaces.

SMPTE Working Group on Component Analog Video Standards (WG-CAVS):
Chairman, 1982 (inception) to 1985 (when superseded by WG-SVS);
Committee developed three standards simultaneously, two in coordination with the European Broadcasting Union (EBU). It also conducted four tests and public demonstrations of its techniques. This led to use throughout the industry of component analog techniques in facilities for over a decade.

SMPTE Working Group on Studio Video Standards (WG-SVS):
Chairman, 1985 (inception) to 1988;
Committee superseded both WG-DVS and WG-CAVS with broad responsibility for all video interface documentation for studio applications at standard scan rates. Personally developed strategy that led to conversion of television production from 8-bit to 10-bit amplitude resolution, including development of 10-bit Serial Digital Interface (SDI) at 270 Mb/s for component operation and 143 Mb/s and 177 Mb/s for composite operation that is now widely applied worldwide. Received Emmy Award nomination for this work.

SMPTE Working Group on Advanced Television Production (WG-ATVP):
Member, 1989 (inception) to 1996 (completion);
Committee had broad responsibility for all video interface documentation for studio applications at scan rates above the current standard;
Chairman, Ad Hoc Group on Document Design and Writing, 1989 to 1995;
Chairman, Ad Hoc Group on Systems Issues, 1989 to 1991.

SMPTE Working Group on ATV Studio Systems Design
Member, 1991 (inception) to 1996 (completion);
Chairman, Ad Hoc Group on Small Station and Cable Headend Considerations, 1992-1996.

SMPTE Working Group on Headers and Descriptors
Member, 1992 (inception) to 1998 (completion);
Committee developed techniques to permit transportation of digital video and audio data intermixed with unrelated data in a general purpose digital communications channel. Helped forge compromise that led to SMPTE Universal Labels standard.

SMPTE Committee on Television Technology (T14)
Member, 1982 through 1991 (completion);
Chairman, 1988 through 1991 (completion);
Committee oversaw activities of Working Groups on Advanced Television Production, Digital Audio Interfaces for Television, Digital Control of Television Equipment, Professional Studio Monitors, Studio Video Standards, the Study Group on Monitoring and Diagnostics in Digital Video Systems, and others.

SMPTE Committee on Television Production Technology (P18)
Chairman, 1992 (inception) through 1995;
Member, 1996 through 1998 (completion);
Committee had general responsibility for all standardization of matters related to television production, including such items as Television Compression Systems, Digital Headers and Descriptors, MPEG Liaison and Testing, Digital Control of Television Equipment, Editing Procedures, Time Code, and the like.

SMPTE Committee on Television Signal Technology (T14)
Member, 1992 (inception) through 1998 (completion);
Committee had general responsibility for all standardization of matters related to interfaces between television equipment of all sorts, including such items as High Definition Serial Interfaces, Serial Digital Fiber Interfaces, Digital Audio Interfaces for Television, Ancillary Data, Jitter, Monitoring and Diagnostics, and the like.

SMPTE Committee on Packetized Television Technology (PT20)
Chairman during formation in late 1995 (relinquished when appointed Engrg. Dir. for TV);
Member 1996 through 1998 (completion);
Committee had general responsibility for all standardization of matters related to television carried in packetized form, including Digital Video Compression Techniques and Parameters, Interfaces and Protocols, Switching and Synchronization, System Design, and others.

SMPTE Engineering Director for Television
Appointed to four one-year terms, 1996 through 1999 (term limit)
Chairman of Television Standards Steering Committee (ST13-14)
Responsible for management of SMPTE television standards development on a worldwide basis including scheduling of meetings, assignment of projects, maintenance of workflow, coordination between committees of technical work. Provided oversight of standards development to assure compliance with SMPTE and ANSI requirements. During tenure in office, helped to increase document throughput several-fold.
Initiated regular, all-inclusive meeting series of television technology committees. Initiated regular meetings of TV Steering Committee during meeting series and participation by all committee and subcommittee leadership. Worked to turn SMPTE into internationally recognized standards body and initiated regular international meetings of TV technology committees. Implemented findings of joint SMPTE/EBU Task Force by reorganizing technology committees along lines of a layered structure and by promoting use of layering concepts necessary in documentation for future bit-stream-based television, as forecast by SMPTE/EBU Joint Task Force. Conceived idea of Dynamic Documents™ to permit efficient extensions of standards without requiring lengthy processing so as to speed up the development of standards.

SMPTE/EBU Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams

Co-chairman, 1996 (inception) to 1998 (completion);

The Task Force, which was jointly established by SMPTE and the European Broadcasting Union (EBU), and included members from the Association of Radio Industries and Businesses of Japan (ARIB), had the goal of setting the worldwide direction for the transition in production, post production, and broadcasting from raster-based to bit-stream-based television. It rationalized the convergence of television, computers, and communications with the aim of providing direction to the development of standards for the next 1-2 decades. The Task Force included 200 experts from four continents, meeting 18 times over about two years, to produce two thorough reports. Initial report on "User Requirements" was released in April, 1997, and published in SMPTE Journal of June, 1997. Final report of "Analyses and Results" was released in September, 1998, and published in SMPTE Journal of the same month.

SMPTE Registration Authority Ad Hoc Group (AHG)

Chairman, 1997 (inception) to present;

AHG has responsibility for development of numerous registration functions required to support future digital television system functionality, including devising new types of standards documents called Dynamic Documents™, setting up major Internet registration data access capability, providing Registration Authority services for MPEG-2 private data types, providing Registration Authority services for ATSC Program, Event, and Version Identifiers (as per ATSC A/57), and the like.

SMPTE Committee on Television Systems Technology (S22)

Chairman, 2000 through 2001;

Committee has general responsibility for aspects of television technology that cross the boundaries of responsibility of the other SMPTE television technology committees and for understanding and managing the systems aspects of television. It therefore has responsibility for such matters as system timing references, time code, machine control, and system level messaging. It also has responsibility for systemization of major areas of development such as data and metadata flows through and between facilities.

SMPTE Committee on Registration and Identification Technology (R30)

Chairman, 2002 (inception) to present;

Committee has general responsibility for development of databases and processing methods to handle registration of identifiers and code points used in structured data systems. It manages the SMPTE Registration Authority and provides processing of requests for registration of those items for which processing is necessary. Its responsibilities extend to oversight of registration of MPEG-2 registration identifiers and general application of the Dynamic Documents™ concept.

ADVANCED TELEVISION SYSTEMS COMMITTEE

ATSC Technology Group on Distribution (T3)

Member, 1998 to present

The committee has responsibility for development of all ATSC standards, with numerous subgroups extant to deal with specific subjects. ATSC is the organization that develops the standards for the digital television broadcasting system adopted in North America and elsewhere in the world.

ATSC Specialist Group on Video (T3/S6)

Member, 1998 to present

Specialist group is responsible for development of ATSC standards related to processing and coding of video. It developed original standards for video and is working on extensions to the standards related to video.

ATSC Specialist Group on Data Multiplex and Transport (T3/S8)

Member, 1998 to present

The specialist group has responsibility for development of standards related to channel tuning, program guide information, conditional access, content protection and copy management, metadata, content identification, content advisories, and the like. In other words, it is responsible for work related to MPEG-2 Systems, including program-specific information and extensions thereto.

Chairman, Ad Hoc Group on Directed Channel Change (DCC), 1998 to present

AHG has documented a method for allowing broadcasters to cause receivers to present alternative streams of program content based upon selection criteria sent to receivers. This allows targeting program content and advertising to viewers for whom it is most appropriate.

Co-Chairman, Ad Hoc Group on Content Identification, 1999 to present

AHG is jointly developing with corresponding SMPTE AHG a method for unique identification of all forms of television content. This will allow automated tracking of programming and automation of television operations.

Member, Ad Hoc Group on Advanced EPG Metadata, 2000 to present

Member, Ad Hoc Group on Metadata Transport, 2001 to present

Member, Ad Hoc Group on Robust Transport, 2001 to present

ATSC Specialist Group on Radio Frequency Transmission (T3/S9)

Member, 2000 to present

Specialist group is developing enhancements to the 8-VSB transmission system that is used as the terrestrial broadcasting method for ATSC-defined signals.

Chairman, Ad Hoc Group on Distributed Transmission & SFNs, 2001 to present

AHG reviewed the Transmitter Synchronization Standard for Distributed Transmission (A/110) that is a personal contribution and that is based on personally-developed technology, for which a patent is pending. It also prepared a Proposed Recommended Practice on Synchronized Multiple Transmitter Networks (PRP/111) that explains implementation aspects of Digital On-Channel Repeaters (DOCRs), Distributed Transmission, and Distributed Translators.

ATSC Implementation Subcommittee (IS)

Member, 1998 to present

The committee reviews any and all matters related to the implementation of ATSC standards. Thus it is considering implementation of Directed Channel Change along with a variety of other aspects of digital television implementation.

Chairman, Ad Hoc Group on Directed Channel Change, 2001 to present

AHG is considering aspects of DCC that are not covered by the standard. Included are methods for broadcasting using DCC and design considerations for receivers that implement DCC.

Member, Systems Evaluation Working Group (SEWG), 2000 to present

SEWG examines all sorts of systems aspects of implementation of ATSC standards. This has included issues of latency of transmission and resulting differences in program emission timing, systems aspects of DCC, appropriate interfaces for carriage of various signals, methods for processing and transporting closed captions, and the like.

Member, Radio Frequency Working Group (RFWG), 2000 to present

RFWG has examined the planning factors used to determine coverage of digital television stations and found flaws in the methods used by earlier committees and the FCC. It is considering methods to improve the accuracy of prediction of signal coverage.

OTHER PROFESSIONAL ACTIVITIES

Video Services Forum, Inc.

Founder and Facilitator, 1998 (inception) through 2000;

The Video Services Forum is the principal organization of common carriers of television services over telephony and satellite networks, the manufacturers serving them, and the users of their services. It includes three sub-organizations: the Video Services Provider Forum, the Video Services Industry Forum, and the Video Services User Group. Services provided to the Forum as Facilitator included incorporating the organization, chairing all meetings including those of the Board of Directors, providing financial management, and supervising on-going development of industry technical and operations standards and practices. Also provided support for the annual VidTranS conference.

Society of Broadcast Engineers (SBE):

Member, 1968 to present;

Helped found Philadelphia chapter and was secretary;

Helped found Northern/Central New Jersey chapter, Certification Chairman, 1991-1996.

Institute of Electrical and Electronics Engineers (IEEE)

Member, 1991 to present.

Society of Cable Telecommunications Engineers (SCTE)

Member, 1993 to present.

Member, Digital Video Subcommittee (DVS), 1996 to present.

Northern California Frequency Coordinating Committee (NCFCC):

Founder in 1978; Chairman, 1978 to 1984.

PAPERS AND PUBLICATIONS:

S. M. Weiss, "Machine Control at KPIX: Cornerstone to Digital," Broadcast Management/Engineering (BM/E), Feb., 1981, pp. 51-59.

S. M. Weiss & R. Marconi, "Putting Together the SMPTE Demonstrations of Component Coded Digital Video, San Francisco, 1981," SMPTE Journal, Oct., 1981, pp. 926-938, and 4:2:2 Digital Video, SMPTE, White Plains, NY, 1989, pp. 46-58.

S. M. Weiss, "The Transition from Analog to Digital – A Scenario," 123rd SMPTE Technical Conference, October 30, 1981, #138.

S. M. Weiss & R. Lorentzen, "How Teletext Can Deliver More Service and Profits," Broadcast Communications, Aug., 1982, pp. 54-60.

S. M. Weiss, "Small Format Video Recorders – A Systems Perspective," 124th SMPTE Technical Conference, November 8, 1982, #11.

S. M. Weiss, "Rolling Your Own – Customized Microcomputers for Custom Applications," 17th SMPTE Television Conference, February 5, 1983, #34.

S. M. Weiss, "A Progress Report from the Working Group on Component Analog Video Standards," 125th SMPTE Technical Conference, November 3, 1983, #80.

S. M. Weiss, "Component Analog Video Standards – A Progress Report," 10th International Broadcasting Convention (IBC), September 22, 1984.

S. M. Weiss, "Working Group Report and Test Results on S-MAC for the Studio," 126th SMPTE Technical Conference, November 1, 1984, #67.

S. M. Weiss, "In the Beginning, There Were Red, Green, and Blue ... A Tutorial on Component Video and a Working Group Progress Report," 19th SMPTE Television Conference, February 15, 1985, #8.

S. M. Weiss, "S-MAC: Proposed SMPTE Studio Component Video Distribution System," National Association of Broadcasters (NAB) Convention, April 15, 1985.

S. M. Weiss & S. N. Baron, "Components at a Crossroads: Making the Right Choices," 127th SMPTE Technical Conference, October 30, 1985.

S. M. Weiss, "Trouble in Transition City: NTSC Setup in a Component Environment," 127th SMPTE Technical Conference, October 31, 1985.

S. M. Weiss, "Component Video – Where Are We Going?" National Association of Broadcasters (NAB) Convention, April 14, 1986.

S. M. Weiss, "Practical Considerations in Implementing Component Video Systems," 11th International Broadcasting Convention (IBC), September 23, 1986.

S. M. Weiss, "Implementing Component Video Systems: Avoiding the Pitfalls," 128th SMPTE Technical Conference, October 29, 1986.

S. M. Weiss, "Extending Current Digital Video Standards to 10 Bits and Beyond," 129th SMPTE Technical Conference, November 2, 1987, #59.

S. M. Weiss, "Migrating to Advanced Television in the United States," 12th International Broadcasting Convention (IBC), September 27, 1988.

S. M. Weiss & K. H. Powers, "NTSC Compatible Advanced Television System and Implications for Studio Standards," Better Video Images, SMPTE, White Plains, NY, pp. 254-266; also presented at 23rd SMPTE Television Conference, February 4, 1989.

S. M. Weiss, "Evolutionary Approaches to Advanced Television – Making the Migration Possible," Better Video Images, SMPTE, White Plains, NY, pp. 361-375; also presented at 23rd SMPTE Television Conference, February 4, 1989.

S. M. Weiss, "Selecting Appropriate HDTV Production Standards for North America: Making the Puzzle Pieces Fit," 131st SMPTE Technical Conference, October 22, 1989.

K. H. Powers & S. M. Weiss, "QDA – The Progressive-Scan Alternative for High Definition Electronic Production Standards," Television – Merging Multiple Technologies, SMPTE, White Plains, NY, pp. 340-349; also presented at 24th SMPTE Television Conference, January 27, 1990.

S. M. Weiss, "Widescreen 525 – An Economical Entry into Advanced Television," National Association of Broadcasters (NAB) Convention, April 1, 1990.

S. M. Weiss, "Rolling Out Advanced Television in the United States," HDTV'90 Colloquium, Ottawa, June 28, 1990.

S. M. Weiss, "The Economics of HDTV for the Commercial Broadcaster," 3rd HDTV Update Conference, Association of Maximum Service Television, September 6, 1990.

S. M. Weiss, "Implementation Considerations for Simulcast HDTV Transmission at Local Television Stations," 40th IEEE Broadcast Technology Symposium, September 7, 1990.

S. M. Weiss, "The Technology of Widescreen 525: Behind the Economics," 132nd SMPTE Technical Conference, October 17, 1990, #133.

S. M. Weiss, "Advanced Television," monthly column in TV Technology magazine, beginning with issue of July, 1992, and continuing through May, 1997.

S. M. Weiss, "Advanced Television Implementation Studies in the FCC Advisory Commitee Process," Workshop on High Data-Rate Digital Broadcasting, Massachusetts Institute of Technology, October 26, 1992.

S. M. Weiss, "The 'New' NTSC Color Television Standard – SMPTE 170M," 134th SMPTE Technical Conference, November 9, 1992, #1.

S. M. Weiss, "Planning for Advanced Television in the United States," Advanced Broadcasting Systems of Canada, March 30, 1993.

S. M. Weiss & R. H. Stow, NAB 1993 Guide to HDTV Implementation Costs, National Association of Broadcasters, Washington, D.C., April, 1993.

S. M. Weiss, "Digital Video Compression, Wireless Cable, and Education," California Distance Learning Summit IV, The Alliance for Distance Education in California, April 27, 1993.

S. M. Weiss, "Budgeting for Initial Implementation of HDTV," Society of Broadcast Engineers Convention, October 1, 1993.

S. M. Weiss, "Digital Video Compression in Television Systems," All-day Tutorial on *Compression: Expectations and Realities*, SMPTE 1994 Advanced Television and Electronic Imaging Conference, February 3, 1994

S. M. Weiss, "Bits, Bytes, Packets, Headers, and Descriptors," National Association of Broadcasters Convention, March 24, 1994

S. M. Weiss, "The Transition to Digital Operation for Wireless Cable," Institute of Electrical and Electronics Engineers, Broadcast Technology Symposium, September 23, 1994.

S. M. Weiss, "The Transition to Digital Operation for Wireless Cable," Private Cable and Wireless Cable Conference, November 14, 1994.

S. M. Weiss, "Reasons and Methods for Characterizing the Wireless Cable Channel for Digital Transmission," Wireless Cable Association Engineering Symposium, February 5, 1995.

S. M. Weiss, "Switching Facilities in MPEG-2: Necessary But Not Sufficient," New Foundations for Video Technology, SMPTE, White Plains, NY, pp. 44-70; edited version in SMPTE Journal, December, 1995, pp. 788-802; also presented at SMPTE 1995 Advanced Television and Electronic Imaging Conference, February 10, 1995.

S. M. Weiss, D. Koo, & E. Leyvi, "A Method for In-Service Characterization of Television Channels," Institute of Electrical and Electronics Engineers, Broadcast Technology Symposium, September 22, 1995.

S. M. Weiss & S. D. Driscoll, "Wireless Cable Channel Characterization – Initial Results," Wireless Cable Association Engineering Symposium, February 4, 1996.

S. M. Weiss, Issues in Advanced Television Technology, Focal Press, Boston, April, 1996.

S. M. Weiss, "New Systems Opportunities for Digital Wireless Cable Operations," Wireless Cable Association Convention, July 10, 1996.

S. M. Weiss, "Rationale for Two-Way and Distributed Transmission Operations of Wireless Cable Systems," Wireless Cable Association Engineering Symposium, February 14, 1997.

S. M. Weiss, "The DTV Phase-In: Timelines and Implementation Issues," in Television Management Conference on "The Switch to DTV — Making It Work," National Association of Broadcasters Convention, April, 1997.

S. M. Weiss, "The Future of Video: A New Era of Broadcasting and Business Applications," Keynote Address for the Broadband Emerging Video Services Conference, May 21, 1997.

H. Schachlbauer, S. M. Weiss, et al, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams, Initial Report: User Requirements," SMPTE Journal, June, 1997.

S. M. Weiss, "Issues in Digital Subscriber System Selection — A Tutorial," Wireless Cable Association Engineering Symposium, November 17, 1997.

S. M. Weiss, "Digital Video Broadcasting and Film: Markets of Today and Tomorrow," Workshop on the Coming Digital Video Economy, University of Kansas, December 19, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Overview," Institution of Electrical Engineers (IEE) (UK) Colloquium, December 5, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for the Harmonized Standards for the Exchange of Programme Material as Bit Streams — Systems," Institution of Electrical Engineers (IEE) (UK) Colloquium, December 5, 1997.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Overview," European Broadcasting Union Seminar "Networks in the Television Studio," January 28, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bit Streams — Systems," European Broadcasting Union Seminar "Networks in the Television Studio," January 28, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Overview," SMPTE Advanced Motion Imaging Conference, "Migrating Toward a Networked Digital Future," February 5, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Overview," SMPTE Seminar "Charting the Course of Television Technology in the Coming Decades: From Rasters to Bit Streams" at National Association of Broadcasters Convention, April 4, 1998.

S. M. Weiss, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams — Systems," SMPTE Seminar "Charting the Course of Television Technology in the Coming Decades: From Rasters to Bit Streams" at National Association of Broadcasters Convention, April 4, 1998.

S. M. Weiss, "Developing Required Strategies for DTV Implementation," in Television Management Conference on "The Road to DTV – Part 1: Choosing the Right Operational Options," National Association of Broadcasters Convention, April 5, 1998.

S. M. Weiss, "Wireless Rebroadcast Issues for Digital TV and Cable," National Association of Broadcasters Convention, April 8, 1998.

S. M. Weiss, "Networking Considerations for Two-Way MMDS," Wireless Communications Association Convention, July 8, 1998.

H. Schachlbauer, S. M. Weiss, et al, "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Program Material as Bit Streams, Final Report: Analyses and Results, July 1998," SMPTE Journal, September, 1998, pp. 605-815.

S. M. Weiss, "The EBU-SMPTE Task Force: Systems Aspects," International Broadcasting Convention, September 11, 1998.

S. M. Weiss, "New Standards for Studio Operations — New Opportunities for Video Services," at VidTranS Conference, October 5, 1998.

S. M. Weiss, "The ATSC Top Down Review — Control Plane," SMPTE Seminar on DTV, at 140th SMPTE Technical Conference, October 28, 1998.

S. M. Weiss, "EBU/SMPTE Task Force – Final Report: Systems," EBU Technical Review, No. 277 – Autumn, 1998, pp. 8-14, European Broadcasting Union, Geneva.

S. M. Weiss, "Where Are We Heading? What Are the Issues?" SMPTE Seminar "Automation and Control: Just a Few More Lines of Code?" at National Association of Broadcasters Convention, April 17, 1999.

S. M. Weiss, "Bottom Line Impact of Worldwide Standards," SMPTE Session on Standards Management for Profitable Technology Exploitation at Montreux International Television Symposium, June 14, 1999.

S. M. Weiss, "Wireless Broadband and Future 'Cable-Ready' Digital TV Receivers," at Wireless Communications Association Convention, July 13, 1999.

S. M. Weiss, "Piecing Together Standards to Support Transport of Digital Television Content," at VidTranS Conference, October 4, 1999.

S. M. Weiss, "VidTranS'99 HDTV Demo Feed from NBC Videotape," at VidTranS Conference, October 4, 1999.

S. M. Weiss, "Interactive Television: At the Nexus of Convergence," at Brazil Digital TV Forum, Saõ Paolo, June 29, 2000.

S. M. Weiss, "Metadata Applications and Options for Production and Transmission," at 142nd SMPTE Technical Conference, October 21, 2000.

S. M. Weiss, "Datacasting Standards and Implementation," at SMPTE 35th Advanced Motion Imaging Conference, February 8, 2001.

S. M. Weiss, "FCC Rules Necessary for 8-VSB Single-Frequency Networks," at National Association of Broadcasters Convention, April 23, 2001.

S. M. Weiss, "Wireless Broadband Access: Spectrum Utilization and Technical Regulation," at National Association of Broadcasters Convention, April 24, 2001.

S. M. Weiss, "ISAN & V-ISAN: Applications & Structure," at International Broadcasting Convention, September 12, 2002.

S. M. Weiss, "8-VSB Single Frequency Networks: Moving Toward Implementation," at IEEE Broadcast Technology Symposium, October 10, 2002.

S. M. Weiss, "8-VSB Distributed Transmission — Implementation & FCC Rules," at Association of Federal Communications Consulting Engineers, March 19, 2003.

S. M. Weiss, "Distributed Transmission Systems — Overcoming the Limitations of DTV Transmission," 2003 NAB Broadcast Engineering Conference Proceedings, pp. 263-279, and presented at National Association of Broadcasters Convention, April 8, 2003.

S. M. Weiss, "Distributed Transmission, Single Frequency Networks, & ATSC Candidate Standard," at Brazil–U.S. Business Council, Conference & Workshop on DTV Development, September 8, 2003.

S. M. Weiss, "Extended Content Control Information (ExCCI) Packet — The Studio Side of DRM," at International Broadcasting Convention, September 14, 2003.

S. M. Weiss & R. D. Weller, "New Measurements and Predictions of UHF TV Receiver LO Radiation Performance," at IEEE Broadcast Technology Symposium, October 17, 2003.

S. M. Weiss, "Single Frequency Networks & Distributed Transmission Techniques for DTV," at IEEE Broadcast Technology Symposium, October 15, 2003.

A. Mattsson, S. M. Weiss, D, Hershberger, Y. Wu, M. Simon, & X. Wang, "Transmitter Identification Techniques for Distributed Transmission Networks," at IEEE Broadcast Technology Symposium, October 15, 2003.

S. M. Weiss, "First Full Scale Implementation of Distributed Transmission — Initial Operation & Results of Testing," at IEEE Broadcast Technology Symposium, October 15, 2003.

S. M. Weiss, "Extended Content Control Information (ExCCI) Packet — The Studio Side of Digital Rights Management," at 145th SMPTE 145th Technical Conference, November 13, 2003.

S. M. Weiss, "Extended Content Control Information (ExCCI) Packet — The Studio Side of Digital Rights Management," at Hollywood Post Alliance Technology Retreat, February 5, 2004.

S. M. Weiss, "Reaching Every Nook and Cranny: DTV Translators, On-Channel Repeaters, and Single Frequency Networks," at Public Broadcasting Service Engineering Conference, April 16, 2004.

S. M. Weiss, "Distributed Transmission Design Examples," at National Association of Broadcasters Convention, April 18, 2004.

S. M. Weiss, K. Brown, R. Yoakum, and R. Knipp, "Obtaining Efficiencies and Economies of Scale in a Multi-Station Transmission Facility," at National Association of Broadcasters Convention, April 19, 2004.

S. M. Weiss, "Design Considerations for Distributed Transmission Networks," at IEEE Broadcast Technology Symposium, October 14, 2004.

S. M. Weiss, "Reception Considerations for Distributed Transmission in ATSC Systems," at IEEE International Conference on Consumer Electronics, January 12, 2005.

S. M. Weiss, "ISAN: International Standard Audiovisual Number," at Hollywood Post Alliance Technology Retreat, January 27, 2005.

S. M Weiss, "Extended Content Control Information (ExCCI) Packet — The Studio Side of DRM," at Hollywood Post Alliance Technology Retreat, January 28,2005.

S. M. Weiss, "ISAN: International Standard Audiovisual Number," at SMPTE Advanced Motion Imaging and VidTrans Conference, February 2, 2005.

S. M. Weiss, "Broadcast Operations Systems Assessment: Workflow Processes, NGIS, & ACE," at PBS 2005 Technology Conference, April 14, 2005.

S. M. Weiss, "Distributed Transmission: Opportunities and Design Objectives," at National Association of Broadcasters Convention, April 21, 2005.

S. M. Weiss, "Single Frequency Networks in ATSC Terrestrial Transmission Systems," at SET Congress 2005, São Paulo, Brazil, September 22, 2005.

S. M. Weiss, "Adjacent Channel Operation of Distributed Transmission Networks," at IEEE Broadcast Technology Symposium, October 14, 2005.

W. Bretl, W. R. Meintel, G. Sgrignoli, X. Wang, S. M. Weiss, & K. Salehian, "ATSC RF, Modulation, and Transmission," Proceedings of the IEEE, Vol. 94, No. 1, January 2006, pp. 44-59.

S. M. Weiss, "Designing Distributed Transmission Systems to Meet FCC Requirements," 2006 NAB Broadcast Engineering Conference Proceedings, pp. 152-161, and presented at National Association of Broadcasters Convention, April 23, 2006.

S. M. Weiss, "Field Testing a Distributed Transmission System," at IEEE Broadcast Technology Symposium, September 29, 2006.

S. M. Weiss, "Archive Interoperability," at Hollywood Post Alliance Technology Retreat, February 1, 2007.

S. M. Weiss, "DTV Single Frequency Networks and Distributed Transmission," NAB Engineering Handbook, 10th Edition, Chapter 6.5, pp. 1563-1594, published April, 2007.

Over 75 other papers and presentations given to local chapters of SMPTE, SBE, STE, IEEE, plus NAB Convention, Video Expo, etc., on subjects of digital video, teletext, machine control, audio systems, plant timing, frequency coordination, Advanced Television, Advanced Compatible Television, High Definition Television (HDTV), Digital Video Compression, Digital Television (DTV), video as bit streams, distributed transmission, and others. In addition, have served numerous times as session chairman or panel moderator at NAB Conventions, SMPTE Conferences, IEEE Broadcast Technology Symposia, EIA Digital Video Workshops, International Broadcasting Conventions (IBC), Montreux International Television Symposia, and Wireless Cable Association Conventions.